

The family Haleciidae (Cnidaria: Hydrozoa) from the Strait of Gibraltar and nearby areas

M.D. Medel, F.G. García & W. Vervoort

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M.D. Medel & F.G. García, Laboratorio de Biología Marina (Zoología), Departamento de Fisiología y Biología animal, Facultad de Biología, Universidad de Sevilla, España, Spain.

W. Vervoort, National Museum of Natural History, Leiden, The Netherlands.

Key words: Cnidaria; Hydrozoa; Leptolida; Haleciidae; Strait of Gibraltar; geographical distribution. A faunistic study of the family Haleciidae from the Strait of Gibraltar and nearby areas has been made; seven species are described, figured and discussed. Information about the zoogeographical distribution, and conditions of substrates are contributed. A key to distinguish the species of this family from the seas of the Iberian Peninsula is presented, and the Iberian Haleciidae are compared with those from the Mediterranean and the British Isles.

Introduction

The Strait of Gibraltar is an important zoogeographical area, because it is a barrier for the establishment of many species in the Atlantic or in the Mediterranean, but it is also the way of communication for species with a wide capacity for dispersion. The shallow water hydrozoan fauna from the Strait of Gibraltar has been unknown for a long time. Besides, many haleciids have a shallow water distribution. In the present paper, seven species of Haleciidae found in this area are described and discussed, and a key to identify the species of the family Haleciidae from the Iberian Peninsula is provided. The Iberian Haleciidae fauna is mainly cosmopolitan and subtropical-Atlantic; the faunistic composition is similar to that of the British Isles, Morocco, and the Mediterranean. Three species that are considered as Mediterranean endemics, have not been found at the Iberian Peninsula. Two species considered Atlantic in origin were found in the Strait of Gibraltar, of which one was also found also by Ramil & Vervoort (1992) in the Alboran Sea.

List of the localities and species collected

Station/locality	coordinates	depth (in m)
Coastal stations		
-C1 El Portil	37°12.40'N,07°07.50'W	0-1
	<i>Ophiodissa mirabilis</i> (Hincks, 1868).	
-C2 Caños de Meca	36°11.00'N,06°01.00'W	0
	<i>Halecium liouvillei</i> Billard, 1934.	
-C3 Isla de Tarifa	36°48.00'N,05°36.00'W	0-45
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium sibogae maroccanum</i> Billard, 1934.	
-C4 Punta Carnero	36°04.36'N,05°25.36'W	0-25
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium halecinum</i> (Linnaeus, 1758).	
-C5 La Ballenera-Getares	36°04.54'N,05°25.36'W	3-15
	<i>Halecium delicatulum</i> Coughtrey, 1876.	
-C6 San García	36°06.35'N,05°25.36'W	5-28

	<i>Halecium delicatulum</i> Coughtrey, 1876.	
-C7	Térnica	36°10.50'N,05°25.00'W
		9-30
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium halecinum</i> (Linnaeus, 1758); <i>Halecium tenellum</i> Hincks, 1861.	
-C8	C.E.P.S.A.	36°10.60'N,05°25.80'W
		12-25
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium tenellum</i> Hincks, 1861.	
-C9	San Felipe	36°09.45'N,05°21.48'W
		2-9
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium halecinum</i> (Linnaeus, 1758).	
-C10	Punta Europa	36°06.00'N,05°21.00'W
		5-18
	<i>Halecium halecinum</i> (Linnaeus, 1758); <i>Halecium tenellum</i> Hincks, 1861.	
-C11	Punta del Desnarigado	35°53.50'N,05°16.20'W
		0-18
	<i>Halecium delicatulum</i> Coughtrey, 1876.	
-C12	Punta Almina	35°54.00'N,05°16.20'W
		20-25
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium halecinum</i> (Linnaeus, 1758); <i>Halecium liouvillei</i> Billard, 1934; <i>Halecium tenellum</i> Hincks, 1861.	
-C13	Punta Saudiño	35°54.35'N,05°17.95'W
		38
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium halecinum</i> (Linnaeus 1758); <i>Halecium liouvillei</i> Billard, 1934; <i>Halecium pusillum</i> (M. Sars, 1857); <i>Halecium tenellum</i> Hincks, 1861.	
-C14	Aguja del Campo	35°54.20'N,05°19.65'W
		20
	<i>Halecium delicatulum</i> Coughtrey, 1876; <i>Halecium halecinum</i> (Linnaeus, 1758); <i>Halecium liouvillei</i> Billard, 1934; <i>Halecium pusillum</i> (M. Sars, 1857).	
-C15	Benzú	35°55.10'N,05°23.25'W
		25
	<i>Halecium halecinum</i> (Linnaeus, 1758); <i>Halecium tenellum</i> Hincks, 1861.	
Campaign FAUNA I		
-F23	Plácer de las Bóvedas	36°24.05'N,05°00.99'W
		30-32
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-F55	Trafalgar	36°05.91'N,06°08.40'W
		38-42
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-F66	off Cádiz	36°30.90'N,06°22.10'W
		25-28
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
Campaign AR.SA.'92		
-A2	Costa de Doñana	36°48.50'N,06°37.10'W
		21
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-A3	Chipiona	36°43.60'N,06°34.20'W
		23
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-A6	off Chiclana	36°19.70'N,06°29.90'W
		84
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-A8	off Cádiz	36°21.50'N,06°35.90'W
		112
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-A10	off Doñana	36°54.10'N,06°47.96'W
		41
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-A16	off Doñana	36°56.40'N,06°50.30'W
		40
	<i>Halecium halecinum</i> (Linnaeus, 1758).	
-A17	off Doñana	36°37.02'N,06°49.30'W
		147
	<i>Halecium halecinum</i> (Linnaeus, 1758).	

Taxonomic results

Infraorder Haleciida Hincks, 1868
 Superfamily Halecioidea Hincks, 1868
 Family Haleciidae Hincks, 1868

Genus *Halecium* Oken, 1815
 (fig. 1)

Halecium delicatulum Coughtrey, 1876

Halecium delicatulum Coughtrey, 1876: 299; Vervoort, 1959: 27-30, figs 4-5 (synonymy).
Halecium gracile; Motz-Kossowska, 1911: 335, figs 7-8, pl. 18 fig. 2.
Halecium mediterraneum; Stechow, 1919: 34.
Halecium flexile; Leloup, 1940: 6.
Halecium tenellum; García Corrales et al., 1978: 9, figs 1-2.

Material examined.— C3: (17.2.1991), 3-4 m, with gonothecae (RMNH- Coel. 27842); (7.6.1992), 3-13 m, with gonothecae. C4: (25.7.1991), 3 m, with gonothecae. C5: (26.7.1990), 3 m, with gonothecae. C6: (29.10.1994), 3-9 m, without gonothecae. C7: (28.8.1991), 2-3 m, with gonothecae; (14.7.1993), 3-13 m, with gonothecae. C8: (16.7.1991), 18 m, without gonothecae. C9: (23.11. 1991), 2-5 m, with gonothecae. C11: (8.5.1986), 0- 18 m, with gonothecae. C12: (13.5.1986), 35 m, with gonothecae. C13: (6.5.1986), 38 m, without gonothecae. C14: (5.5. 1986), without gonothecae.

Description.— Hydrocauli monosiphonic or polysiphonic, growing in dense groups, irregularly branched in all directions (fig. 1a, b). Axis and branches divided into internodes separated by oblique nodes, alternately directed left and right. Each internode with a hydrophore, placed on one side at the distal end, and alternately directed to right and left (fig. 1c). Primary hydrotheca shallow, gradually widening towards the aperture, with a basal diaphragm, and with a row of desmocytes on the wall for attachment of the hydranth (fig. 1e). Rim everted, perpendicular to length axis of hydrophore; this with a thickening of perisarc (pseudodiaphragm) at the adcauline side. Several hydrothecae may originate from the diaphragm of a previous hydrotheca, with more or less developed hydrophores (fig. 1d).

Male gonothecae ovoid, elongated and laterally compressed (fig. 1g). Female gonothecae almost spherical and slightly laterally compressed (fig. 1f).

Measurements (in mm).—

Hydrocalus, maximum height	25
Internodes, length	0.40 - 0.64
diameter	0.09 - 0.13
Hydrotheca, length	0.03 - 0.05
diameter	0.13 - 0.19
Gonotheca, length	0.5 - 1
diameter	0.275 - 0.425

Substrate.— *Halecium delicatulum* is very abundant in the area studied. It has been found growing on seaweeds, bryozoans, ascidians, barnacles, and on *Synthecium*

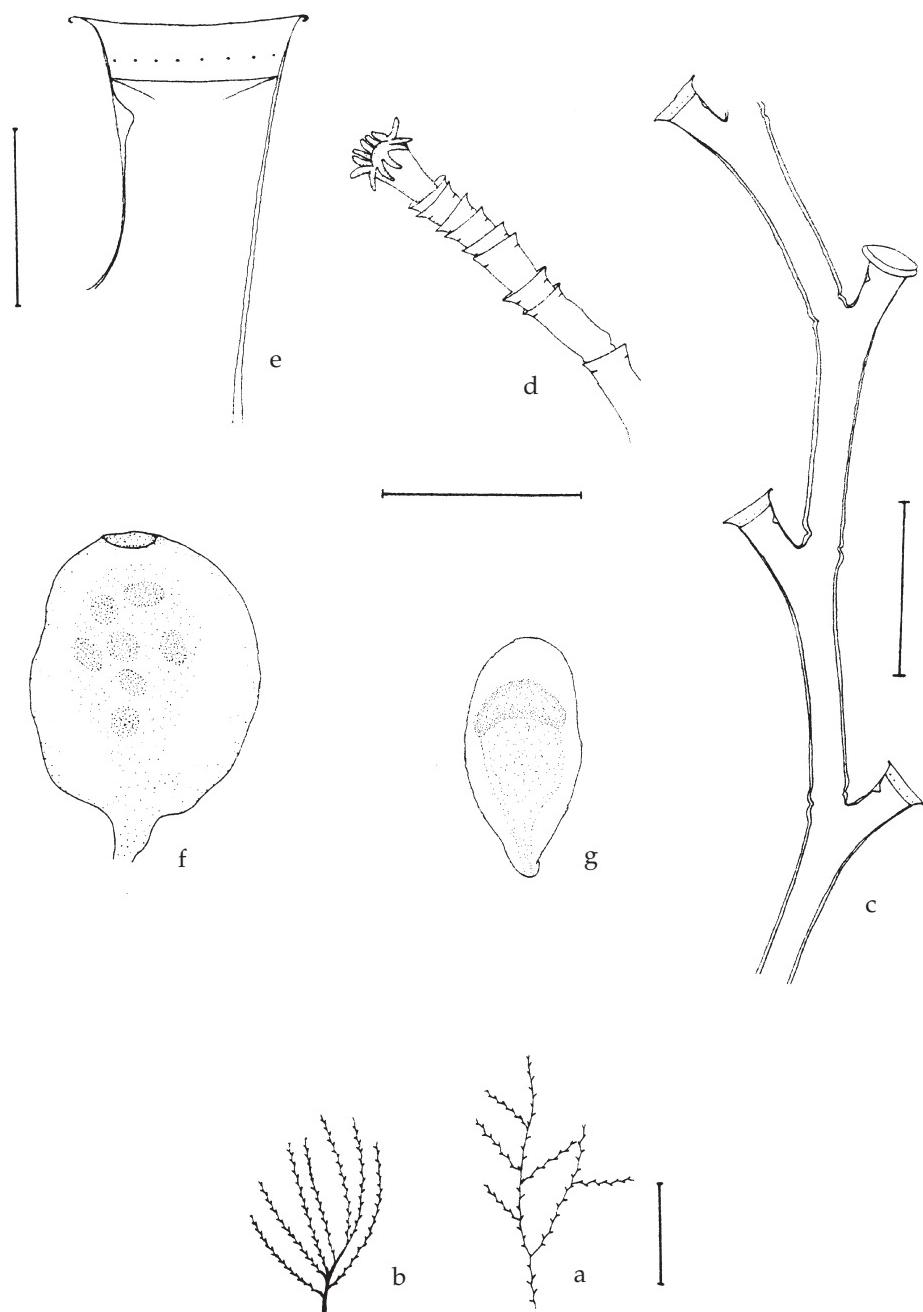


Fig. 1. *Halecium delicatulum* Coughtrey, 1876, from Isla de Tarifa (C3). a, b, shape of colony; c, part of hydrocladium; d, renovated hydrotheca; e, primary hydrotheca; f, female gonotheca; g, male gonotheca. Scales: a, b, 1 cm; c, d, f, g, 0.5 mm; e, 0.1 mm.

evansii (Ellis & Solander, 1786). Roca Martinez (1986) found it on *Eudendrium racemosum* (Gmelin, 1791); Ramil and Vervoort (1992) on *Sertularella gayi* (Lamouroux, 1821), and Watson (1994) on sponges.

Distribution.— *H. delicatum* is considered a circumglobal species, characteristic of tropical and subtropical waters (Rees & Vervoort, 1987), penetrating Pacific waters as far north as Japan and Canada, and going in the Atlantic as far north as Morocco; southwards its distribution extends into the Antarctic. It is common in the littoral zone of the French coasts and in the Mediterranean (Ramil & Vervoort, 1992). It is also cited from the Arctic (Leloup, 1940). Following Boero & Bouillon (1993), we consider this species to be cosmopolitan. The depth records are between 2 m (present work) and 2035 m (Ramil & Vervoort, 1992).

Halecium halecinum (Linnaeus, 1758)
(fig. 2)

Sertularia halecina Linnaeus, 1758: 809.

Halecium halecinum; Oken, 1815: 91; Vervoort, 1972: 25-26, fig. 3a.

Thoa halecina; Johnston, 1838: 119-120, pl. 6 figs 1-4.

Material examined.— C4: (25.7.1991), 3 m, without gonothecae. C7: (5.7.1991), 5 m, without gonothecae; (18.8.1991), 6 m, without gonothecae; (27.1.1992), 8 m, with female gonothecae. C9: (23.11.1991), 5 m, without gonothecae. C10: (14.7.1993), 10-18 m, without gonothecae. C12: (13.5.1986), 20-25 m, with male gonothecae. C13: (6.5.1986), without gonothecae. C14: (5.5.1986), 20 m, without gonothecae. C15: (10.5.1986), 25 m, without gonothecae. F23: (13.7.1989), 30-32 m, without gonothecae. F51: (19.7.1989), 27-28 m, without gonothecae. F55: (20.7.1989), 38-42 m, without gonothecae. F66: (27.7.1989), 25-28 m, without gonothecae. A2: (10.10.1992), 21 m, without gonothecae. A3: (10.10.1992), 23 m, with female gonothecae (RMNH-Coel. 27841, slide 4024). A6: (11.10.1992), 84 m, male and female gonothecae. A8: (11.10.1992), 112 m, without gonothecae. A10: (13.10.1992), 41 m, without gonothecae. A16: (20.10.1992), 40 m, with female gonothecae. A17: (21.10.1992), 147 m, with female gonothecae.

Description.— Hydrocauli erect, strongly polysiphonic over greater part of their length, branched, perisarc brown to yellowish in youngest parts. Axis and hydrocladia in the same plane, branches irregularly alternate (fig. 2a). Monosiphonic parts of colony divided into internodes separated by oblique nodes pointing alternately left and right. Primary hydrothecae sessile, disposed laterally on an apophysis at extreme end of each internode and in alternate position, pointing left and right (fig. 2b). Hydrothecae shallow, with almost straight walls; rim not everted, adcauline sides partly adnate or close to internode. Several hydrothecae provided with one or more hydrophores of varied lengths, originating from diaphragm of previous hydrotheca (fig. 2b).

Male gonothecae ovoid, elongated (fig. 2d). Female gonothecae gradually widening towards flattened distal end, provided with two laterally disposed hydrothecae (fig. 2c).

Measurements (in mm).—

Maximum height of the colony	180
Hydrocladial internodes, length	0.33 - 0.64
diameter	0.13 - 0.19

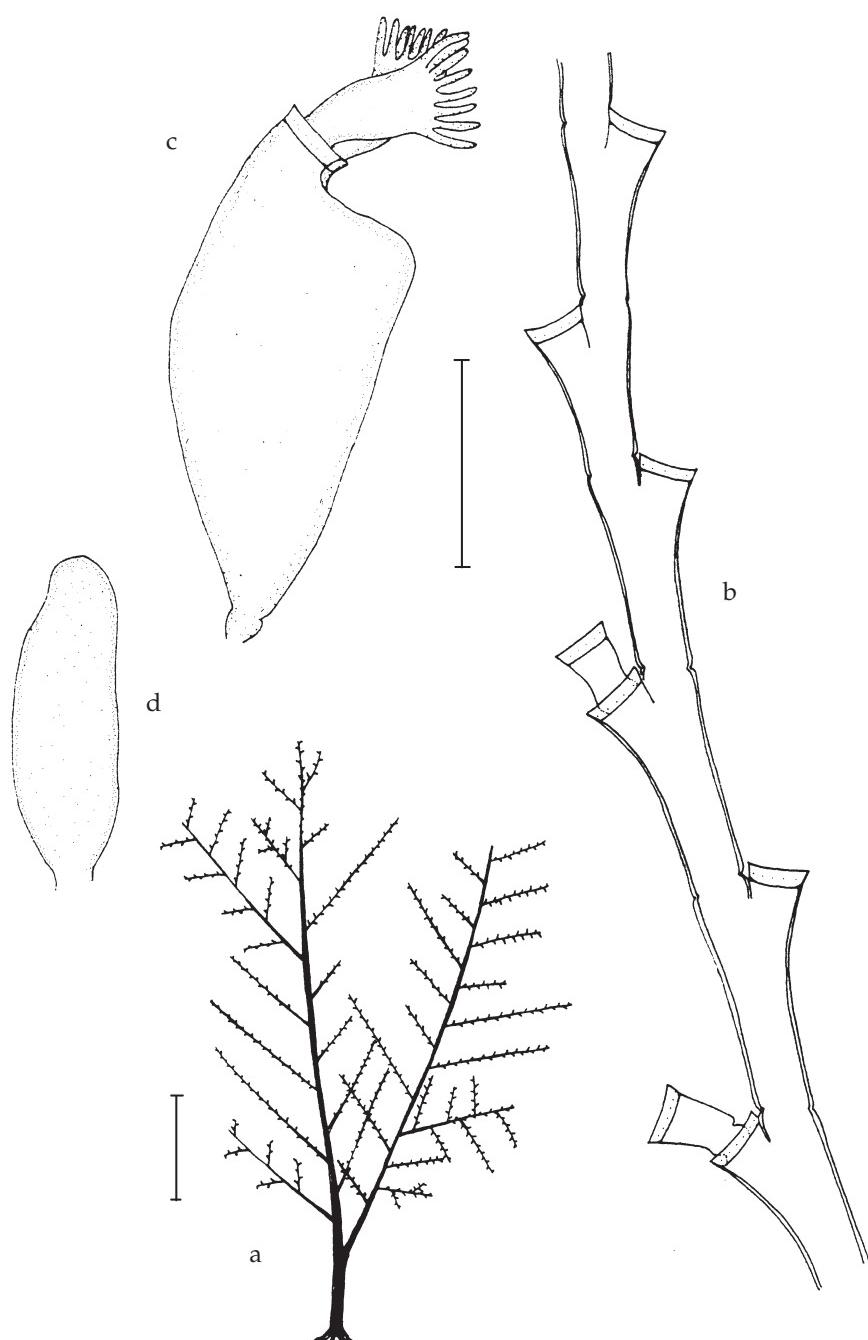


Fig. 2. *Halecium halecinum* (Linnaeus, 1758), a-c, from Chipiona (A3); d, from Punta Almina (C1). a, shape of colony; b, part of hydrocladium; c, female gonotheca; d, male gonotheca. Scales: a, 2 cm; b-d, 0.5 mm.

Hydrothecae, length	0.02 - 0.05
diameter at rim	0.13 - 0.18
Male gonothecae, length	0.70 - 1.05
diameter	0.29 - 0.375
Female gonothecae, length	0.75 - 1.00
diameter	0.425 - 0.550

Substrate.— The material studied was growing on stones, barnacles and tubes of polychaetes. It has been also recorded from shells (Cornelius, 1975), seaweeds and other hydroids (Boero & Fresi, 1986).

Discussion.— *Halecium halecinum* and *H. beanii* (Johnston, 1838) are similar species. They mainly differ in morphology of the female gonothecae (Millard, 1975; Roca Martinez, 1986; Álvarez, 1993). However, adult colonies of *H. halecinum* are regularly pinnate while those of *H. beanii* are not, making a bushy appearance (Álvarez, 1993; Vervoort, 1946). In the present material all colonies, with or without female gonothecae, have the same pinnate aspect and consequently have been considered to represent *H. halecinum*. Gili et al. (1989) pointed out that, in *H. beanii*, the hydrophores are distinctly separated from the wall of the axis, in contradistinction to the condition observed in *H. halecinum*.

Distribution.— Cosmopolitan (see Álvarez, 1993). Depth records are from between 0.5 m (Boero & Fresi, 1986) and 310 m (Naumov, 1960); occasionally found much deeper (Medel & Vervoort, in prep.).

Halecium liouvillei Billard, 1934
(fig. 3)

Halecium Liouvillei Billard, 1934: 227, fig. 1; Leloup, 1937: 94, 116, fig. 2; Ramil Blanco & Pulpeiro, 1991: 63-68, figs 1-3.

Material examined.— C2: (11.2.1990), 0 m, with female gonothecae. C12: (4.5.1986), (14.5.1986), 20-25 m, without gonothecae. C13: (6.5.1986), 38 m, without gonothecae (RMNH-Coel. 27844). C14: (5.5.1986), 20 m, without gonothecae.

Description.— Hydrocauli erect, branched or unbranched, some annulations at basal part of axis may be present (fig. 3a). Internodes with thick perisarc, separated by oblique nodes, pointing alternately right and left, not in straight line but giving axis a zig-zag appearance (fig. 3b). Primary hydrothecae disposed laterally at the end of each internode, alternately directed left and right, sessile, deep, with distinct diaphragm, and gradually widening from base onward; rim wide, occasionally everted but not recurved. Adcauline side of hydrotheca longer than abcauline side, set off from internode. Ring of desmocytes present inside hydrotheca. Several hydrothecae may originate from diaphragm of previous hydrotheca, but secondaries usually with longer, annulated hydrophore (fig. 3c).

Female gonothecae only have so far been observed, originating from inside of hydrothecae. They have a narrow annulated pedicel and gradually widen towards their end. Superior part is enlarged on one side, while on other side two closely adnate hydrothecae are present (fig. 3d).

Measurements (in mm).—

Maximum height of colonies	34
Internodes of hydrocaulus, length	0.38 - 0.90
diameter	0.13 - 0.24
Internodes of hydrocladium, length	0.53 - 0.70
diameter	0.12 - 0.17
Hydrotheca, length	0.03 - 0.08
diameter at the diaphragm	0.12 - 0.14
diameter at the rim	0.19 - 0.22
Gonotheca, length	0.95 - 1.00
diameter	0.50 - 0.53

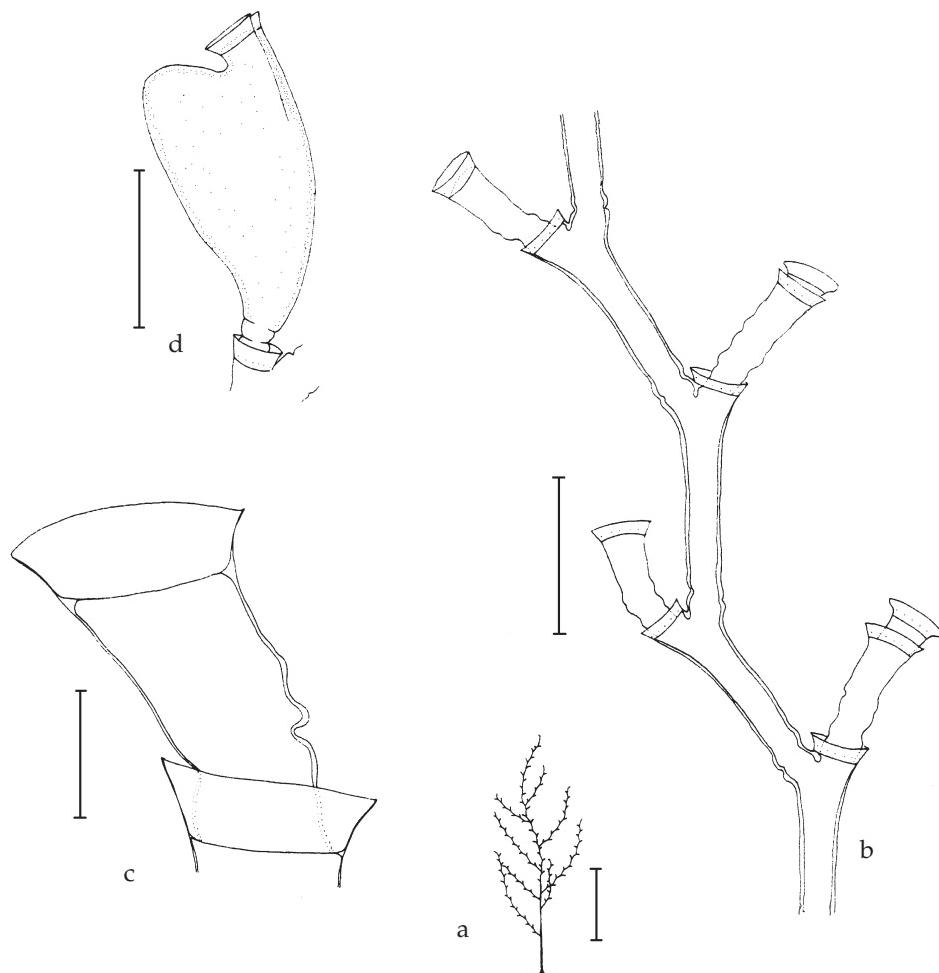


Fig. 3. *Halecium liouvillei* Billard, 1934, from Caños de Meca (C2). a, shape of colony; b, part of hydrocladium; c, primary and secondary hydrothecae; d, female gonotheca. Scales: a, 1 cm; b, d, 0.5 mm; c, 0.1 mm.

Substrate.— The colonies were found growing on rocks, associated with *Tubularia ceratogyne* C. Pérez, 1920, and on Bryozoa. The species has been cited also from sandy bottoms, growing on *Eudendrium* spec., polychaete tubes, shells and ascidians (Ramil & Iglesias, 1988); also on Gorgonacea (Altuna, 1994b).

Distribution.— Atlantic coasts of Morocco (Billard, 1934; Leloup, 1937) and Iberian Peninsula (Ramil & Iglesias, 1988; Altuna, 1994b). The depth records are between 0 and 60 m (Altuna, 1994b).

Variability.— Colonies found at 0 m depth were monosiphonic and scarcely branched, but those from deeper water were polysiphonic at their base and had well developed branches.

Discussion.— Altuna (1994b) described the gonothecae of *H. liouvillei* for the first time from European waters. They are also present in our material but show slight differences with those described by Altuna (1994b) and Leloup (1937). According to the descriptions of these authors the gonothecae are flat at their distal end, where they show a single hydrotheca, while in the present material they are distally enlarged on one side and have two hydrothecae. New fertile material would be needed to resolve this controversy.

Halecium pusillum (M. Sars, 1857)
(fig. 4)

Eudendrium pusillum M. Sars, 1857: 154, pl. 1 figs 14-16.

Halecium pusillum; Motz-Kossowska, 1911: 347, figs 13c, 15-16.

Halecium schneideri Bonnevie, 1898: 3, 10, pl. 1 figs 10-10b.

Halecium annulatum Stechow, 1919: 33.

Halecium corrugatissimum; Patriti, 1970: 25-26, fig. 24 (not *Halecium corrugatissimum* Trebilcock, 1928).

Material.— C13: (6.5.1986), 38 m, without gonothecae. C14: (5.5.1986), 20 m, without gonothecae.

Description.— Hydrocauli erect, with thin perisarc and annulated internodes. Hydrothecae situated at end of each internode; branches originating laterally, below hydrothecae, curved at their base (fig. 4a). Hydrothecae shallow, diaphragm distinct, walls straight at basal half and curved outward at distal part (fig. 4c); desmocytes present. Apical stolons at end of axis are frequently present (fig. 4b).

No gonothecae occur on colonies examined.

Measurements (in mm).—

Maximum height of the colony	1.2
Hydrothecae, length	0.03
diameter	0.12 - 0.17
Diameter of hydrophores	0.07 - 0.1

Substrate.— The material studied was found growing on seaweeds and on *Eudendrium* spec. Ramil (1988) found it on rocky and sandy bottoms with shells, on Bryozoa, shells, ascidians, and on *Obelia bidentata* Clark, 1875; Altuna (1994a) on barnacles, and Boero & Fresi (1986) on sea-grass.

Distribution.— *Halecium pusillum* is widely distributed in the Mediterranean

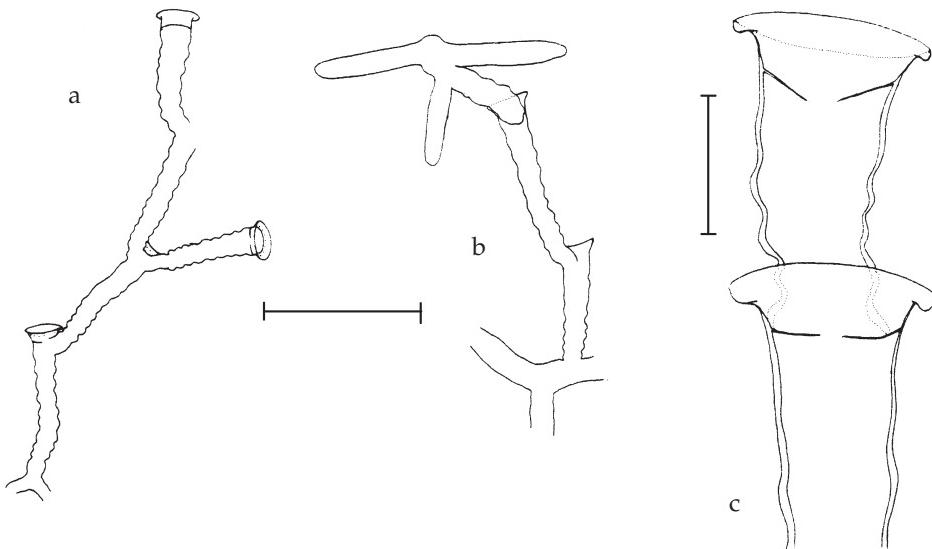


Fig. 4. *Halecium pusillum* (M. Sars, 1857), from Ceuta (C13 & C14). a, shape of colony; b, apical stolon developing from hydrotheca; c, renovated hydrotheca. Scales: a, b, 0.5 mm; c, 0.1 mm.

(Roca Martínez, 1986), along the French Atlantic coasts (Philbert, 1935), the coasts of Spain (Medel & López González, 1996) and along the north coast of Africa [Morocco (Patriti, 1970) and Ceuta, present material]. It has also been recorded from the Atlantic coast of South America and from the Indian Ocean (Ramil, 1988). Its presence in the Pacific has not unambiguously been established (Gili, 1986). Depth records are from between 0 (Ramil, 1988) and 38 m (present work).

Discussion.— Roca Martínez (1986) and Ramil & Iglesias (1988) found valid differences between *H. pusillum* and *H. labrosum* Alder (1859), based on the female gonothecae. They are thus not in accordance with Cornelius (1975) who considered the two species identical. In the opinion of Ramil & Iglesias (1988) they can be separated even without gonothecae, because the rim of the hydrotheca in *H. labrosum* is curved downwards while in *H. pusillum* it is curved upwards. This last character is present in our material. Also well developed colonies of *H. labrosum* Alder (1859) are polysiphonic and not regularly wrinkled (Cornelius, 1995), while those of *H. pusillum* are monosiphonic and regularly wrinkled. For these reasons we have referred our material to *H. pusillum*.

Distribution.— The material examined originates from the African coast of the Strait of Gibraltar. We consider *H. corrugatissimum* sensu Patriti, 1970, from Morocco, to be conspecific with *H. pusillum* (M. Sars, 1857), because of the similarity in drawings and descriptions of both authors. *H. corrugatissimum* Trebilcock, 1928, is a species only known from New Zealand but similar to *H. pusillum* and we do not reject the possibility that they turn out to be identical.

Halecium sibogae marocanum Billard, 1934
(fig. 5)

Halecium Sibogae marocanum Billard, 1934: 229, fig. 2; Van Praet, 1979: 880; Ramil & Vervoort, 1992: 86-90, figs 21a-e, 22a-b; Peña Cantero, 1995: 222-224, pl. 23 figs a-g; Medel & López González, 1996: 199.

Halecium sibogae var. *marocanum*; Patriti, 1970: 25, fig. 23.

Material examined.— C3: (24.8.1989), 20-25 m, without gonothecae (RMNH-Coel. 27846, slide 4025).

Description.— Hydrocaulus strongly polysiphonic and branched, with thick perisarc in older parts of colony (fig. 5a); monosiphonic parts divided into internodes with several annulations at their base. Primary hydrophores originating at distal end of each internode, apophysis of following internode curved, rising from base of hydrophores (fig. 5b-d). Internodes frequently branched, arranged in different planes. Primary hydrophore with comma-shaped perisarc fold of adcauline wall at place of fusion with wall of internode (fig. 5d). Hydrothecae deep, with thin diaphragm and with desmocytes for attachment of hydranth. Hydrothecal walls straight over almost whole of length, widening at the rim and everted (fig. 5e). Several hydrothecae may originate from primary hydrotheca; secundary usually with longer hydrophore, annulated at its base (fig. 5d).

Gonothecae are not present in the material examined.

Measurements (in mm).—

Maximum height of the colony	50
Internodes, length up to base of hydrothecae	0.65 - 1.15
length up to following apophysis	0.55 - 0.77
diameter below apophysis	0.21 - 0.25
Hydrothecae, length	0.09 - 0.11
diameter at rim	0.26 - 0.32
diameter at diaphragm	0.18 - 0.20
Length of primary hydrophores	0.15 - 0.30

Substrate.— The material studied was found growing on rocks. Ramil & Vervoort (1992) found it on others hydroids and on worm tubes.

Distribution.— *Halecium sibogae marocanum* is a rarely recorded subspecies. Previously, it has been found along the Atlantic coast of Morocco (Billard, 1934; Patriti, 1970; Ramil & Vervoort, 1992), in the Strait of Gibraltar and in the Alboran Sea (Ramil & Vervoort, 1992). The depths records are between 20 (present work) and 580 m (Ramil & Vervoort, 1992). The present material is the first that it is found above the 100 m level.

Discussion.— As a characteristic feature of this subspecies, Ramil & Vervoort (1992) mention the comma-shaped perisarc fold at the base of the primary hydrophore (also present in the nominate subspecies *Halecium sibogae sibogae* Billard, 1929).

Our material differs from that of Ramil & Vervoort (1992), Peña Cantero (1995) and Medel & Vervoort (in prep.), in having branches in different planes, by the annulated base of the internodes [in this respect also different from Billard's (1934) materi-

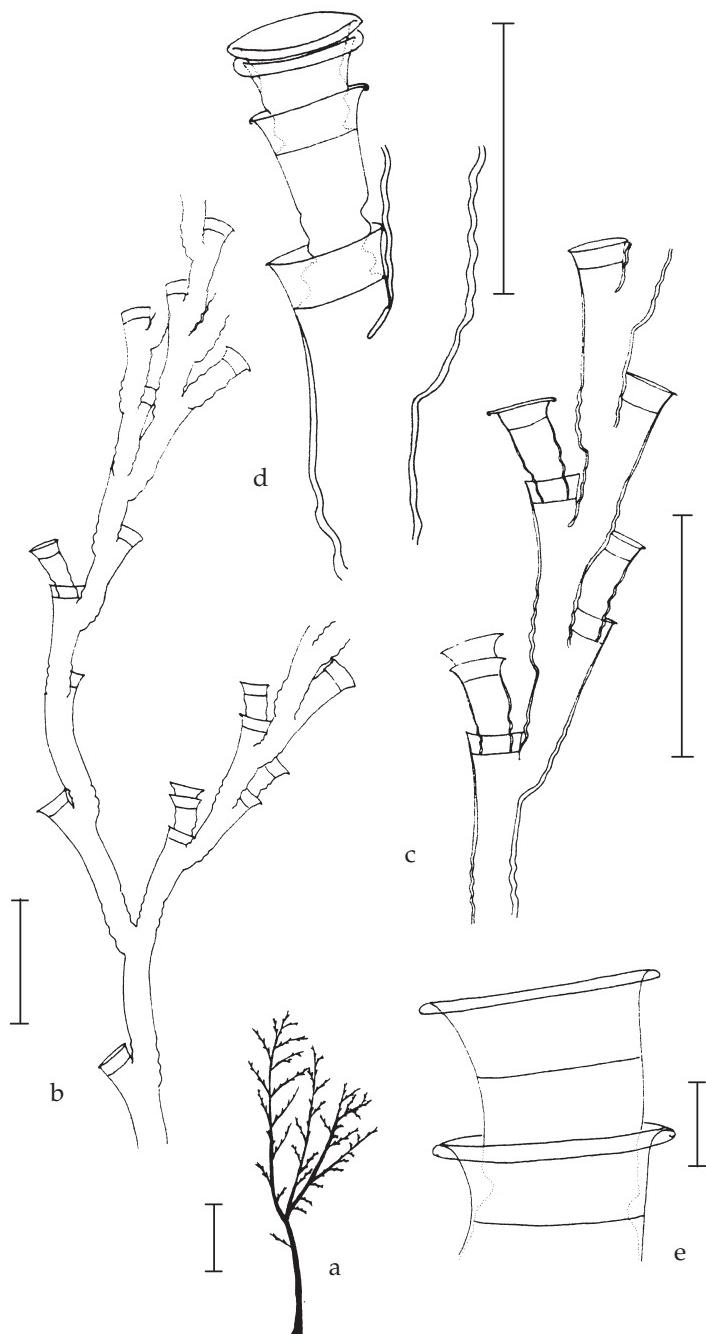


Fig. 5. *Halecium sibogae marocanum* Billard, 1934, from Isla de Tarifa (C3). a, shape of colony; b, part of colony showing pattern of ramification; c, part of branch; d, e, renovated hydrothecae. Scales: a, 1 cm; b, c, 1 mm; d, 0.5 mm; e, 0.1 mm.

all], by the shorter internodes, that are frequently branched and are arranged in different planes, and by the bigger size of our material. The measurements are also bigger than those recorded by Billard (1929, 1934) for *H. sibogae sibogae* and for the subspecies *H. sibogae marocanum*, respectively.

H. s. sibogae differs from *H. sibogae marocanum*, in having bigger colonies (up to 11 cm the first, up to 2 cm the second), shorter hydrophores, and hydrothecae that are less recurved, less everted at the rim, and have wider diaphragms. Ramil & Vervoort (1992) consider those differences insignificant, but they prefer to maintain the subspecies *H. sibogae marocanum* until more material has been studied. Our samples differ from the material described by Billard (1934) and Ramil & Vervoort (1992), and may represent a new variety or subspecies. It is, nevertheless, not abundant and has no gonothecae; so for the moment, we prefer to maintain the two subspecies separate and to include our material in *Halecium sibogae marocanum*. The nominate subspecies is only known from the Malay Archipelago (Billard, 1929) and from Fiji (Gibbons & Ryland, 1989).

Halecium tenellum Hincks, 1861
(fig. 6)

Halecium tenellum Hincks, 1861: 252, pl. 6 figs 1-4; 1868: 226-227, pl. 45 figs 1, 1a-c; Cornelius, 1975: 409-411, fig. 12.

Not *Halecium tenellum* García Corrales, Aguirre Inchaurbe and González Mora, 1978: 9-13, figs 1-2 = *Halecium delicatulum* Coughtrey, 1876.

Halecium geniculatum Nutting, 1899: 744, pl. 63 figs 1, 1d (not *Halecium geniculatum* Norman, 1867).

Halecium washingtoni Nutting, 1901: 789.

Material examined.— C7: (14.7.1993), 3-13 m, without gonothecae. C8: (22.2.1991), 15 m; (12.7.1991), 17 m, both without gonothecae. C10: (14.7.1993), 10-18 m, without gonothecae. C12: (4.5.1986 and 13.5.1986), 20-25 m, with gonothecae (RMNH-Coel. 27843). C13: (6.5.1986), 38 m, with gonothecae. C15: (10.5.1986), 25 m, without gonothecae.

Description.— Hydrocaulus monosiphonic, thin and slender, irregularly branched (fig. 6a). Internodes disposed in zig-zag fashion and separated by distinct transverse nodes (fig. 6b). Hydrothecae provided with hydrophore arranged laterally at distal end of each internode and alternately directed right and left (fig. 6b). Hydrothecae shallow, diaphragm and desmocytes distinct, and walls progressively wider from base to top; rim everted and curved downwards (fig. 6c). Several hydrothecae, provided with hydrophores, may arise from primary hydrothecae, from which ramifications may also originate.

Gonothecae oval, laterally compressed and with circular opening at distal end (fig. 6d).

Measurements (in mm).—

Maximum height of the colony	8
Internodes, length	0.58 - 0.81
diameter	0.06 - 0.07
Hydrothecae, length	0.03 - 0.04

diameter	0.12 - 0.16
Gonothecae, length	0.35 - 0.51
diameter	0.12 - 0.20

Substrate.— The material studied here was mainly found on others hydroids but it has also been recorded growing on polychaete tubes, Bryozoa, dead corals and gorgonians, sponges and gastropod shells (Álvarez, 1993).

Distribution.— Cosmopolitan (Millard, 1975; Álvarez, 1993). Depth records range from 0 to 523 m (Ramil & Vervoort, 1992); occasionally found much deeper (Medel & Vervoort, in prep.).

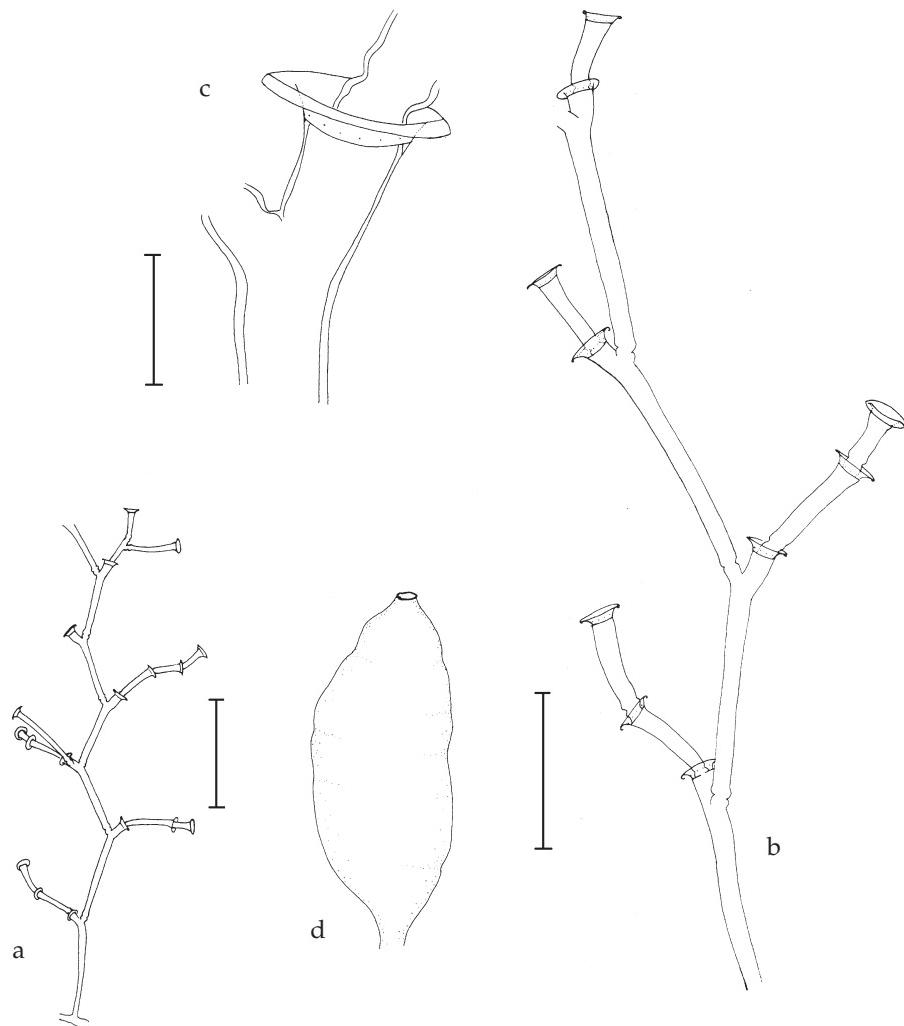


Fig. 6. *Halecium tenellum* Hincks, 1861, from Ceuta (C12 & C13). a, shape of colony; b, part of branch; c, renovated hydrotheca; d, gonotheca, sex undeterminate. Scales: a, 1 mm; b, d, 0.5 mm; c, 0.1 mm.

Genus *Hydrodendron* Hincks, 1874
Hydrodendron mirabile (Hincks, 1866)
 (fig. 7)

Ophiodes mirabilis Hincks, 1866: 422-423, pl. 14 figs 1-5; 1868: 231-233, pl. 45 fig. 2.

Ophiodissa mirabilis; Stechow, 1919: 42; Cornelius, 1975: 414-417, fig. 14; Medel & López González, 1996: 200.

Hydrodendron mirabile; Boero, 1981: 182.

Hydrodendron mirabile; Rees & Vervoort, 1987: 13. 20.

Ophiodes caciniformis Ritchie, 1907: 500-501, pl. 23 figs 11-12, pl. 24 fig. 1, pl. 25 fig. 5.

Ophiodissa caciniformis; Stechow, 1919: 42; Vervoort, 1959: 218, figs 1-2.

Diplocyathus caciniformis; Leloup, 1935: 10.

Hydrodendron caciniformis; Millard, 1957: 186, fig. 3; 1975: 158, fig. 51.

Material.— C1: (15.10.1989), 0 m, without gonothecae (RMNH-Coel. 27845); (21.2.1983), 0 m, without gonothecae.

Description.— Colonies with reticulate hydrorhiza giving rise to erect, monosiphonic hydrocauli, sparingly branched in the upper parts (fig. 7a, b). Axis divided into internodes separated by transverse nodes. Hydrophores laterally at distal end of each internode, alternately pointing left and right, of varied length, and provided with some irregular annulations (fig. 7d). Perisarc of hydrophores thicker at basal part; fragmented hydrophores, without hydrotheca, frequently found. Hydrothecae deep, progressively widening from halfway onward, rim everted, occasionally curved downwards; a thin diaphragm present at base of hydrothecae and a ring of desmocytes on the walls (fig. 7d). Polyps provided with 20 tentacles. Nematothecae present on hydrorhiza and hydrophores, tubular in basal 2/3, progressively widening distally and there cup-shaped (fig. 7d, e). Nematophores elongate, capitate distally, strongly retractile (fig 7e). Stems with stolons developing from hydrothecae, growing and branching rapidly under laboratory conditions (fig. 7c).

Gonothecae absent in material studied.

Measurements (in mm).—

Maximum length of the colony	15
Internode, length	0.31 - 0.55
diameter	0.11 - 0.14
Hydrothecae, length	0.06 - 0.10
diameter	0.18 - 0.21
Nematothecae, length	0.12 - 0.18
diameter	0.08 - 0.12

Substrate.— The colonies studied were growing on rocks. The species has also been recorded from seaweeds, sponges, Bryozoa, and from other hydroids (Ramil & Iglesias, 1988).

Distribution.— *Hydrodendron mirabile* is considered by Boero & Bouillon (1993) a circumtropical species. It has been reported in the eastern and western Atlantic, the Mediterranean, Indian Ocean, and in the Pacific. Depth records range between 0 (present work) and 65 m (Vervoort, 1959).

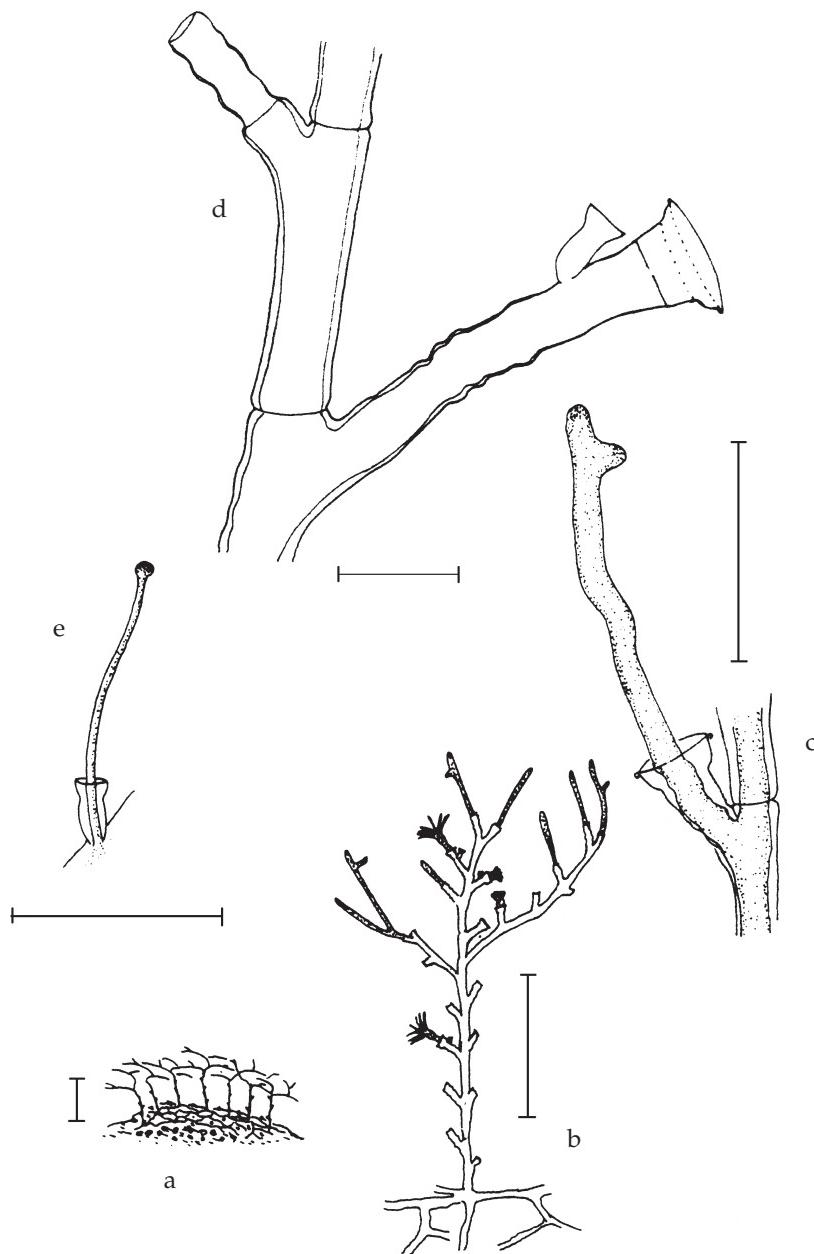


Fig. 7. *Hydredendron mirabile* (Hincks, 1866), from El Portil (C1). a, colonies attached to substrate; b, shape of individual colony; c, stolon developing from hydrotheca; d, internodes with hydro- and nematotheca; e, nematotheca. Scales: a, 1 cm; b, 5 mm; c, e, 0.5 mm; d, 0.2 mm.

Discussion.— Several authors (Vervoort, 1959; Cornelius, 1979b; Medel & López González, 1996) have placed this species in the genus *Ophiodissa* Stechow, 1919, because of the presence of nematothecae, reserving the genus *Hydrodendron* Hincks, 1874, for the unique species without nematothecae, *H. gorgonoide* (G.O. Sars, 1874). However, Rees & Vervoort (1987) pointed out that Bonnevie (1898) reported nematothecae in the type material of that species. According to Cornelius (1995), the development of nematothecae in this group of species has received more taxonomical attention that it really deserves and he consequently considers the two genera synonymous. However, he does not reject the future re-establishment of the genus *Ophiodissa* (Stechow, 1919), as its type species is quite different. We accept the synonymy of the two genera, because presence or absence of nematothecae is not a reliable character. For the establishment of genera in the family Haleciidae other characters and preferably a combination of characters should be used.

Here, we follow Cornelius (1975) in considering *Ophiodissa caciniformis* (Ritchie, 1907) an invalid species as it is principally based on the height of the colony. Although other authors later on attributed additional specific characters, all of those were also observed by Cornelius (1975) in *H. mirabile*. This author pointed out the complete similarity in characters of the type material of both species.

Zoogeographical remarks on the Haleciids from the Iberian Peninsula

The family Haleciidae of the Iberian Peninsula is represented by 16 species (see Medel & López González, 1996). Of these species 5 are cosmopolitan [*Halecium beanii*, *H. delicatulum*, *H. halecinum*, *H. sessile* Norman, 1867; and *H. tenellum*], 4 are tropical-Atlantic [*Halecium lankesteri* (Bourne, 1890), *H. nanum* Alder, 1859, *H. pusillum* and *Mitrocomium cirratum* Haeckel, 1879], 3 are boreal [*Halecium labrosum* Alder, 1859, *H. muricatum* (Ellis & Solander, 1786) and *Hydranthea margarica* (Hincks, 1863)], 2 are restricted to the Atlantic area near to the Iberian Peninsula (*Halecium liouvillei* and *H. sibogae marocanum*), 1 is Atlanto-Mediterranean (*H. petrosum* Stechow, 1919), and 1 is circumtropical (*Hydrodendron mirabile*). Thus one-third of the haleciid fauna of the Iberian Peninsula has a wide zoogeographical distribution (cosmopolitan and circumtropical) while two-thirds are restricted to the Atlantic and the Mediterranean.

Comparison of the list of the Iberian Haleciidae with that published by Boero & Bouillon (1993) for the Mediterranean (17 species), shows that, with the exception of *Halecium banyulense* Motz-Kossowska, 1911, *H. conicum* Stechow, 1919, and *Hydranthea aloysii* (Zoja, 1893), the remaining Mediterranean species are also cited from the Iberian coasts. The three listed above are the only species considered endemic to the Mediterranean, but their absence from the Mediterranean coast of the Iberian Peninsula is remarkable. On the other hand, *H. liouvillei*, considered an Atlantic species, has been found in the Strait of Gibraltar (Medel & López González, 1996; present work), so its presence in the Mediterranean could be expected. The same applies to *H. sibogae marocanum*, considered to be an Atlantic species, but its presence in the Strait of Gibraltar (Ramil & Vervoort, 1992; present work) and in the Alboran Sea (Ramil & Vervoort, 1992), show it to have an Atlanto-Mediterranean distribution.

Finally, the British fauna of Haleciidae (12 species are enumerated by Cornelius, 1995) also shows a high degree of similarity with the Iberian fauna. Only two species

[*Halecium undulatum* Billard, 1922 and *Hydrodendron gorgonoide* (G.O. Sars, 1874)], both considered Boreal species, are not found at the Iberian Peninsula. The seven species listed by Patriti (1970) for the Atlantic coasts of Morocco, have also been recorded from the Iberian Peninsula.

Key to the species of Haleciidae from the Iberian Peninsula

- | | | |
|----|--|---|
| 1 | Hydranth provided with intertentacular web | 2 |
| - | Hydranth without intertentacular web. Fixed sporosacs | 3 |
| 2 | Colonies releasing free medusae | Genus <i>Mitrocomium</i> |
| | | One species: <i>Mitrocomium medusiferum</i> |
| - | Colonies releasing free medusoids | Genus <i>Hydranthea</i> |
| | | One species: <i>Hydranthea margarica</i> |
| 3 | Nematothecae present | Genus <i>Hydrodendron</i> |
| | | One species: <i>Hydrodendron mirabile</i> |
| - | Nemathotecae absent | Genus <i>Halecium</i> 4 |
| 4 | Hydrothecae recurved at the rim | 5 |
| - | Hydrothecae not recurved at the rim | 10 |
| 5 | Comma-shaped perisarc fold present at the base of hydrophores | <i>Halecium sibogae</i> var. <i>marocanum</i> |
| - | Hydrophores without this character | 6 |
| 6 | Internodes smooth | 7 |
| - | Internodes with annulations | 9 |
| 7 | Nodes oblique | 8 |
| - | Nodes transverse | <i>Halecium tenellum</i> |
| 8 | Primary hydrotheca separated from the apophysis by a node, gonothecae with rows of spines | <i>Halecium muricatum</i> |
| - | Without these characters. Hydrothecae with an abcauline thickening | <i>Halecium delicatulum</i> |
| 9 | Monosiphonic colonies with annulated internodes; gonothecae corrugated and without terminal aperture | <i>Halecium pusillum</i> |
| - | Polysiphonic colonies with irregularly undulated internodes; female gonothecae not corrugated and with terminal aperture | <i>Halecium labrosum</i> |
| 10 | Internodes of varied length and with undulations | 11 |
| - | Internodes of equal length | 12 |
| 11 | Nodes distinct; female gonothecae not corrugated, not with hydrotheca opening distally | <i>Halecium lankesteri</i> |

- No distinct nodes, several undulations present; female gonothecae corrugated, with two hydrothecae opening distally..... *Halecium nanum*

- 12 Hydrothecae sessile 13
- Hydrothecae with a short hydrophore *Halecium petrosum*

- 13 Hydrothecae shallow 14
- Hydrothecae deep, internodes with a thick perisarc *Halecium liouvillei*

- 14 Hydrothecal renovations sessile, without hydrophore *Halecium sessile*
- Hydrothecae renovations provided with distinct hydrophore 15

- 15 Colonies pinnate, stems erect, more or less parallel; female gonothecae with pair of hydrothecae opening distally *Halecium halecinum*
- Colonies bushy, not regularly pinnate, branches flexuosus; female gonothecae kidney-shaped; hydrothecae opening in center of concavity *Halecium beanii*

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